ous, in a long, rather dense spike; lateral sepals linear-oblong, 4 lines long, the upper ovate; lip linear or linear-lanceolate, entire, rather acute, nearly a half inch long, shorter than the spur; anther retuse; pedicels of the pollen masses slender; glands orbicular; capsule oblong, 6–8 lines long, sessile; root fleshy-fibrous.

Dry southward slopes of the Pinos Altos Mountains, New Mexico, in open woods of *Pinus ponderosa*, in flower September 14th, 1880.

A striking species, in floral character most like *H. sparsiflora*, Watson, which grows by shady streamlets in the same region, but of very different habit, being nearly leafless, the foliage reduced to mere loosely sheathing bracts, their tips only somewhat leafy-spreading, and the stout stems flowering from near the ground.—EDWARD LEE GREENE.

Peltandra Virginica.—It is worth noting, if it has not already been done in some of our botanical serials, that Rafinesque in establishing the genus distinguished two species, *P. Virginica* and *P. undulata*. Modern botanists have accepted the former, and reduced the latter to a synonym. In the recent monograph of *Araceæ* by Engler *P. undulata* is restored to its distinctive position. Engler remarks that it has some similarity to *P. Virginica*, but differs in the inflorescence. The peduncle is shorter, not much longer than the petiole, the tube of the spathe is oblong not subfusiform, and the lamina of the spathe wholly green with no white anywhere about it. The female portion of the spadix is one-fourth to one-fifth the length of the male, while in *P. Virginica* it is two-thirds, and the ovarium is few-, rarely one-ovuled, while *P. Virginica* has never more than one. Both forms have been freely distributed as *P. Virginica*. The true *P. undulata* has been noted in specimens of Canby from Delaware, Boott from Boston, Schweinitz from Pennsylvania, Porcher from South Carolina, and Rugel from the foot of the Black Mountains in North Carolina. Both species seem about equally distributed geographically.—T. M.

Chlorophyll.—In NATURE for April 14 Mr. Sydney H. Vines gives an interesting review of the results of Dr. Pringsheim's investigations into the nature and function of this puzzling substance. Dr. Pringsheim some time ago startled physiologists by announcing that chlorophyll was not the direct agent of assimilation, but rather a screen for protoplasm which in the light thus subdued did the work. Of course such a careful and conscientious investigator must have had some sure ground to stand upon and hence this subject of the formation of chlorophyll has attracted a good deal of attention. These later observations, referred to by Mr. Vines, are considered by Dr. Pringsheim as confirming the views he had before expressed.

It may be of interest to our laboratory workers to know that Dr. Pringsheim has been using a new method of treating chlorophyll corpuscles. He treats them with a dilute acid, or warms them in water, or exposes them to the action of steam. The result is that chloro-

phyll escapes from the corpuscle, "together with certain fluid or semi-fluid substances which accompany it, in the form of viscid drops, leaving the ground substance of the corpuscle as a colorless, apparently protoplasmic, hollow sphere, with a much perforated wall."

By this means Dr. Pringsheim was able to get some little idea of the nature of Hypochlorin, a substance whose existence in chlorophyll-corpuscles he had previously announced. Under the acid treatment this substance appears as dark brown masses which eventually assume a crystalloidal appearance. From the fact that no hypochlorin can be detected when the corpuscles are warmed in water or exposed to steam it is inferred that it is decomposed by heat.

The effects of intense light upon the various cell contents are very interesting. It appears that although under ordinary circumstances the chlorophyll-corpuscles lose their color when exposed to intense light, such will not be the case in the absence of oxygen or in red light. This leads to the conclusion that this decolorization is a result of oxidation and the products gases.

An unexpected conclusion of Dr. Pringsheim is that in this same chlorophyll corpuscle are carried on the diametrically opposite functions of assimilation and respiration. The apparent contradiction is explained thus. The coloring matter of the chlorophyll-corpuscles absorbing certain rays of light permit the protoplasmic base of the corpuscles to do the work of assimilation; but this same absorbed light, thus kept from the protoplasmic base, can do the work of respiration. If therefore light is too intense these rays are not all absorbed and respiratory work overbalances that of assimilation. Mr. Vines states Prof. Pringsheim's principal results as follows:

"1. That the presence of chlorophyll favors the assimilatory activity of the chlorophyll-corpuscle in consequence of the absorption, by the chlorophyll, of light, which would promote respiratory activity.

2. That hypochlorin is the substance which is the first visible product of this assimilative activity, and that the other substances (starch, glucose, oil, tannin) which are found in chlorophyll corpuscles are derived from hypochlorin by oxidation."—J. M. C.

Some New Mexican Ferns. II.—Three Notholænas grow here, all of great beauty. The largest, *N. sinuata*. Kaulfuss, is a very peculiar fern, as well as a very handsome one. The fronds grow in clumps of five or six, and are from one to two feet long, while their extreme width is less than two inches. It is simply pinnate, the pinnae large, roundish, and crenate-sinuate, alternate on the rachis, of a bright green color above, and below covered very densely with a yellowish-brown pubescence which becomes darker as the season advances. It is from the color of the lower side that it receives its common name of "The Golden Fern." It usually grows among rocks on the hillsides, where it is exposed to the brightest sunshine. When it grows in the shade is becomes very tall and slender, and somewhat drooping. It fruits during October.

Notholæna Hookeri, D. C. Eaton, rarely reaches a foot in height;